

EFFECTS OF COMPOSITION ON PHYSICAL PROPERTIES OF SPI¹/PVA²/PVP³ FOAM SHEETS⁴

SAMPLE	PVA/PVP (PARTS)	DENSITY (g/cc)	TENSILE STRENGTH (MPa) ⁵	ELONGATION (AT BREAK, %) ⁵	YOUNG'S MODULUS (MPa) ⁵
1	0/0	0.53	6.47 ± 0.56	7.67 ± 1.61	164.90 ± 49.60
2	2/0	0.61	4.70 ± 0.37	23.39 ± 5.09	125.30 ± 33.33
3	3/0	0.47	5.72 ± 0.55	28.13 ± 12.05	153.00 ± 33.43
4	2/2	0.47	7.61 ± 0.64	8.48 ± 0.82	178.70 ± 25.40
5	10/3	0.52	6.95 ± 0.75	15.22 ± 3.46	161.00 ± 24.20

¹SPI: SOY PROTEIN ISOLATE

²PVA: POLY(VINYL ALCOHOL)

³PVP: POLY(VINYL PYRROLIDONE)

⁴FORMULATION: 100 PARTS SPI, 80 PARTS WATER, 25 PARTS GLYCEROL, AND 1 PART SODIUM TRIPOLYPHOSPHATE, (ALL BASED ON 100 PARTS DRY WEIGHT SOY PROTEIN)

⁵MEAN ± STANDARD DEVIATION.

Fig. 1

EFFECTS OF PVA CONCENTRATION ON PHYSICAL PROPERTIES OF SPI¹/PVA²/PVP³ FOAM SHEETS⁴

SAMPLE	PVA/PVP (PARTS)	DENSITY (g/cc)	TENSILE STRENGTH (MPa) ⁵	ELONGATION (AT BREAK, %) ⁵	YOUNG'S MODULUS (MPa) ⁵
1	0	0.45	4.96 ± 0.88	3.69 ± 0.75	205.7 ± 38.2
2	10/2	0.54	6.40 ± 0.68	4.2 ± 0.56	243.6 ± 38.7
3	20/2	0.56	7.54 ± 0.82	9.17 ± 2.86	257.7 ± 51.10
4	30/2	0.52	7.65 ± 0.68	6.72 ± 1.55	266.4 ± 27.4
5	40/2	0.53	8.04 ± 0.48	11.61 ± 3.08	281.1 ± 27.9

¹SPI: SOY PROTEIN ISOLATE

²PVA: POLY(VINYL ALCOHOL)

³PVP: POLY(VINYL PYRROLIDONE)

⁴FORMULATION: 100 PARTS SPI, 80 PARTS WATER, 20 PARTS GLYCEROL, 0.5 PARTS POTASSIUM SORBATE (PRESERVATIVE), AND 1 PART SODIUM TRIPOLYPHOSPHATE, (ALL BASED ON 100 PARTS DRY WEIGHT SOY PROTEIN)

⁵MEAN ± STANDARD DEVIATION.

Fig. 2

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